

## CLAIMS

I claim:

1        1. A self-locking linear adjustment mechanism comprising:  
2        a locking tumbler;  
3        an adjustment vernier;  
4        two end adapters;  
5        two roll pins;  
6        two precision balls;  
7        two locking skirts;  
8        two springs;  
9        two locking splines;  
10       two index pins; and  
11       two guide shafts,  
12       wherein the self-locking linear adjustment mechanism has a  
13       dual function self-locking feature.

1       2. The self-locking linear adjustment mechanism according to  
2       claim 1, wherein the locking tumbler is a longitudinally extending  
3       member that extends for a predetermined distance and has two  
4       opposing ends, each end having a recess defined therein.

1       3. The self-locking linear adjustment mechanism according to  
2       claim 2, wherein the locking tumbler further comprises two opposing  
3       pockets configured to enable placement and retention of the two  
4       precision balls.

1           4. The self-locking linear adjustment mechanism according to  
2 claim 3, wherein the balls are positioned not to be in contact with  
3 faces of the locking splines when the self-locking linear  
4 adjustment mechanism is in a locked position.

1           5. The self-locking linear adjustment mechanism according to  
2 claim 3, wherein the balls are guided by a diameter of the internal  
3 spline of the adjustment vernier.

1           6. The self-locking linear adjustment mechanism according to  
2 claim 1, wherein the locking tumbler is secured in place axially by  
3 two standard roll pins that tangentially engage grooves in the  
4 locking tumbler.

1           7. The self-locking linear adjustment mechanism according to  
2 claim 1, wherein the adjustment vernier includes a central member  
3 with two tubular members extending longitudinally away from the  
4 central member in opposing directions.

1           8. The self-locking linear adjustment mechanism according to  
2 claim 1, wherein each tubular member includes proximal and distal  
3 ends relative to the central member of the adjustment vernier, and  
4 a plurality of slits equally spaced about an associated tubular  
5 member.

1        9. The self-locking linear adjustment mechanism according to  
2 claim 8, wherein each tubular member is externally threaded in a  
3 predetermined manner for a predetermined distance from the distal  
4 end to the proximal end of an associated tubular member.

1        10. The self-locking linear adjustment mechanism according to  
2 claim 9, wherein each tubular member has a predetermined inner  
3 circumference at the proximal end that is less than a predetermined  
4 inner circumference at the distal end of the tubular member.

1        11. The self-locking linear adjustment mechanism according to  
2 claim 1, wherein each end adapter longitudinally extends for a  
3 predetermined distance, has inner and outer ends, the inner end of  
4 the end adapter being configured for engaging the distal end of a  
5 corresponding tubular member of the adjustment vernier, and the  
6 outer end of the end adapter being configured for engaging another  
7 element.

1        12. The self-locking linear adjustment mechanism according to  
2 claim 1, wherein between the inner end and the outer end of each  
3 end adapter a passage inhibitor is provided that includes a hole  
4 defined therein configured for allowing a correspondingly  
5 configured guide shafts to pass therethrough.

1        13. The self-locking linear adjustment mechanism according to  
2 claim 1, further comprising roll pins configured for securing the  
3 locking tumbler axially in place by tangentially engaging grooves  
4 in the locking tumbler. and corresponding holes in the adjustment  
5 vernier.

1        14. The self-locking linear adjustment mechanism according to  
2 claim 1, wherein the locking skirts are configured for fitting  
3 around an assembly of locking splines, index pins, and guide  
4 shafts.

1        15. The self-locking linear adjustment mechanism according to  
2 claim 14, wherein the locking skirts extend for a predetermined  
3 length and have an inner end and an outer end, the inner end being  
4 configured for being placed proximate the central member of the  
5 adjustment vernier, and the outer end being configured with a  
6 raised spherical shoulder for engaging the distal end ramp of the  
7 corresponding tubular member of the adjustment vernier.

1        16. The self-locking linear adjustment mechanism according to  
2 claim 1, wherein each locking spline extends for a predetermined  
3 length and has an inner end and an outer end, the inner end of each  
4 locking spline having a plurality of external splines configured  
5 for engaging with internal splines at the proximal end of the  
6 tubular elements of the adjustment vernier.